

1

**TOTAL HIP REPLACEMENT SURGICAL  
GUIDE TOOL****CROSS REFERENCE TO RELATED  
APPLICATIONS**

The present application claims benefit of priority under 35 U.S.C. 119(e) to: U.S. Patent Application 61/032,671, entitled Hip Resurfacing Surgical Guide Tool and filed Feb. 29, 2008; U.S. Patent Application 61/108,761, entitled Hip Resurfacing Surgical Guide Tool and filed Oct. 27, 2008; and U.S. Patent Application 61/111,238, entitled Total Hip Replacement Surgical Guide Tool and filed Nov. 4, 2008. The foregoing applications are hereby incorporated by reference into the present application in their entireties.

The present application also incorporates by reference in its entirety copending U.S. patent application Ser. No. 12/390,667, entitled Hip Resurfacing Surgical Guide Tool, and filed on the same date as the present application, namely, Feb. 23, 2009.

**FIELD OF THE INVENTION**

The present invention relates to medical apparatus and methods. More specifically, the present invention relates to total hip replacement surgical guide tools and methods of manufacturing and using such tools.

**BACKGROUND OF THE INVENTION**

Arthroplasty is an orthopedic surgical procedure in which a dysfunctional or arthritic joint surface is replaced, remodeled or redesigned to alleviate pain, restore range of motion or to fix physical joint damage caused by a fracture. Total Hip Replacement ("THR") surgery, also known as hip arthroplasty, is a surgical procedure wherein the proximal femur, with its femoral head and neck, is removed and a prosthetic device (or stem) having a prosthetic femoral head is implanted into the femur. The acetabulum, or hip socket, is also replaced or modified to accept a cup. The cup is configured to receive the prosthetic head. The prosthetic device (or stem) is typically made of titanium or a titanium alloy. The head may be made of a biocompatible plastic, ceramic or other suitable material. The cup may be made of a biocompatible plastic or other suitable material. The prosthetic device and the cup are typically anchored to the bone with bone cement.

Typically, in THR, the surgeon will take a number of measurements by hand or x-ray scan related to proper selection of the prosthetic device, limb length, and hip rotation. During surgery, after making an incision, the femur is pushed out of socket to expose the joint cavity and the deteriorated or damaged femoral head is removed. The femur is then prepared to receive the stem by cleaning and enlarging the hollow center portion of the bone, thereby creating a cavity that matches the shape of the implant stem. The top end of the femur is planed and smoothed so the stem can be inserted flush with the bone surface. If the head is a separate piece, the proper size is selected and attached. Finally, the head is seated within the cup so the joint is properly aligned and the incision is closed.

Hand measuring techniques and x-ray scans are inaccurate and increase the error rate or potential for error in a THR, and may lead to an improperly positioned prosthetic device. Improper positioning of the prosthetic device can result in a change of leg length, dislocation of the hip or perforation of the femur.

2

There is a need in the art for a total hip replacement surgical guide tool to aid in properly positioning the prosthetic device that reduces the potential for error and improper positioning in a THR. There is also a need in the art for a method of manufacturing such a surgical guide tool.

**BRIEF SUMMARY OF THE INVENTION**

Disclosed herein is a tool for positioning a prosthetic device in a femur that is the subject of a total hip replacement surgery. In one embodiment, the tool includes an index surface and a saw slot. The index surface is configured to matingly receive a predetermined surface of the femur. The index surface and the saw slot are integrated with each other such that when the index surface matingly receives the predetermined surface of the femur, the saw slot corresponds with the resection plane of the femur.

Disclosed herein is surgical guide tool for use in the preparation of a proximal portion of a femur for the implantation of a total hip replacement prosthetic implant, the implant including a feature configured to abut against a resection surface of the proximal femur when the implant is fully implanted in the proximal femur in a manner that generally replicates a preoperatively planned implantation for the implant. In one embodiment, the tool includes a mating region and a saw guide. When the mating region matingly contacts the proximal portion, the saw guide is aligned with a resection plane generally corresponding to the resection surface. In one version of the embodiment, the saw guide includes at least one planar surface. In one version of the embodiment, the at least one planar surface forms a saw slot.

Disclosed herein is a surgical guide tool for use in total hip replacement surgery on a proximal portion of a femur having a head, a neck extending distally from the head, and a surface region distal the head. In one embodiment, the tool includes a body including a saw guide and a mating region configured to matingly contact the surface region. The saw guide and mating region are positioned relative to each other so the saw guide is positioned to guide a resection that generally corresponds to a preoperatively planned resection plane when the mating region matingly contacts the surface region. The surface region includes at least a portion of a superior-posterior region of the neck. The at least a portion of a superior-posterior region of the neck starts between approximately 1 mm and approximately 5 mm after a cartilage covering the head terminates distally and extending between approximately 15 mm and approximately 35 mm towards a trochanteric fossa. In version of the embodiment, the saw guide includes at least one planar surface. In one version of the embodiment, the at least a portion of a superior-posterior region of the neck has an inferior border that begins approximately midway along an intertrochanteric crest and follows along the axis of the neck. In one version of the embodiment, the at least a portion of a superior-posterior region of the neck has a superior border between approximately 1 mm and approximately 3 mm below a junction between superior and anterior surfaces of the neck.

Disclosed herein is a surgical guide tool for use in total hip replacement surgery on a proximal portion of a femur having a head, a neck extending distally from the head, and a surface region distal the head. In one embodiment, the tool includes a body including a saw guide and a mating region configured to matingly contact the surface region. The saw guide and mating region are positioned relative to each other so the saw guide is positioned to guide a resection that generally corresponds to a preoperatively planned resection plane when the mating region matingly contacts the surface region. The sur-